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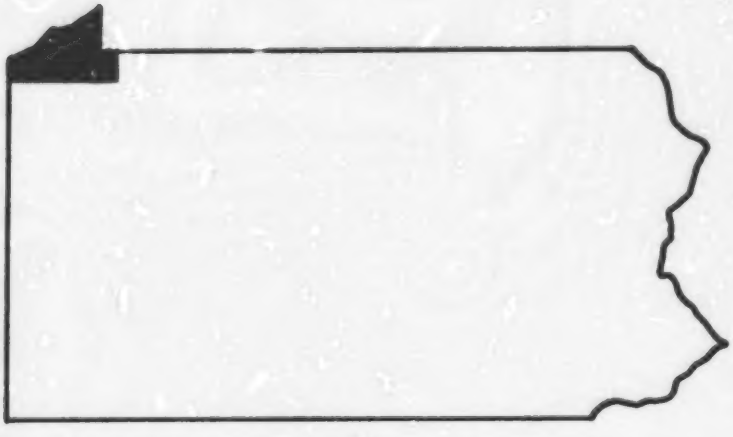
FLOOD INSURANCE STUDY



TOWNSHIP OF AMITY, PENNSYLVANIA
ERIE COUNTY

NOVEMBER 4, 1988

COMPLETED

Federal Emergency Management Agency

COMMUNITY NUMBER - 421360

ORIGINAL

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NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program (NFIP) have established repositories of flood hazard data for floodplain management and flood insurance study purposes. This Flood Insurance Study (FIS) may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

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FLOOD INSURANCE STUDY
TOWNSHIP OF AMITY, ERIE COUNTY, PENNSYLVANIA

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the Township of Amity, Erie County, Pennsylvania, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood risk data for various areas of the community that will be used to establish actuarial flood insurance rates and assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the state (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were prepared by the Pittsburgh District of the U. S. Army Corps of Engineers (COE) using the Reservoir Storage Frequency Curve for Union City Reservoir and French Creek. The work for that study was completed in February 1971 and revised in September 1984.

1.3 Coordination

On December 19, 1986, the Township of Amity was notified by the Federal Emergency Management Agency (FEMA) of the initiation of a Flood Insurance Study for the community.

On December 2, 1987, a final Consultation and Coordination Officer's (CCO) meeting was held with representatives from FEMA and the Township of Amity.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Township of Amity, Erie County, Pennsylvania. The area of study is shown on the Vicinity Map (Figure 1).

Union City Reservoir was studied by detailed methods for its entire shoreline within the community. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction.

The following flooding sources were studied by approximate methods: French Creek, Beaver Run, Lake Pleasant Outlet, and Hubbel Run. Approximate analyses were used to study those areas having a low development potential or minimal flood hazards.

2.2 Community Description

The Township of Amity is located in southeast Erie County in northwestern Pennsylvania. It is bordered by the Borough of Wattsburg and the Township of Venago to the north, the Township of Wayne to the east, the Township of Union to the south, and the Borough of Waterford to the west. Amity has a total area of approximately 27.5 square miles.

The climate for Erie County is characterized as "Great Lakes Leeward," causing average summers and cloudy wet winters. Median summer and winter temperatures are 75 degrees Fahrenheit (^{o}F) and 26^{o}F, respectively (Reference 1). Mean annual precipitation is 37.5 inches and the mean annual snowfall is 83.8 inches (Reference 2). Precipitation is well distributed throughout the year.

Waterford is located in the glaciated portion of the Allegheny Plateau Physiographic Province. The land surface is moderately rolling and consists primarily of undifferentiated glacial moraninal deposits.

2.3 Flood Protection Measures

Union City Dam is located on French Creek in the Township of Waterford, approximately 71.5 miles upstream from its confluence with the Allegheny River. The reservoir, located entirely in Erie County, has a drainage area of approximately 222 square miles. The maximum recorded flow at the damsite occurred on April 5, 1947, with a discharge of 14,900 cubic feet per second (cfs). Construction of the dam was started in July 1968, and completed in September 1971 (Reference 3).

UNION CITY RESERVOIR
ERIE COUNTY
CHAUTAUQUA COUNTY
PENNSYLVANIA
ERIE COUNTY
WARREN COUNTY
ERIE
CRAWFORD COUNTY
ERIE COUNTY
CRAWFORD COUNTY
WARREN COUNTY
ERIE COUNTY
PENN CENTRAL
Edinboro
Drakeburn
Carlson
McLane
McLellan Corners
Drakes Mills
Waterford
Waterford Theater
Waterford Township Hall
Union City
Wattsburg
Girard
Corry
North Clymer
Clymer
Clymer Center
Cutting
Aviation area
Radio tower
Fire Points
State Fish Hatchery
Miners Sta.
Pioneer station
Television tower
Sawmill
Trey Mills
Cem
Camp
1455
1303
1259
1715
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1722
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3.0 ENGINEERING METHODS

For the flooding source studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (1 percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10), and, for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak elevation-frequency relationships for the flooding source studied in detail affecting the community.

The hydrologic information for Union City Reservoir was prepared using a reservoir storage frequency curve for the Union City Reservoir and French Creek basin (Reference 4).

The stillwater elevations for the 10-, 50-, 100-, and 500-year floods have been determined for Union City Reservoir and are summarized in Table 1, "Summary of Stillwater Elevations."

TABLE 1 - SUMMARY OF STILLWATER ELEVATIONS

FLOODING SOURCE AND LOCATION	ELEVATION (feet) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
UNION CITY RESERVOIR				
Entire shoreline within community	1,271.8	1,276.4	1,278.3	*

*Not computed

All elevations are referenced to the National Geodetic Vertical Datum of 1929 (NGVD).

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4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each Flood Insurance Study provides 100-year flood elevations and delineations of the 100- and 500-year floodplain boundaries and 100-year floodway to assist communities in developing floodplain management measures.

4.1 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1 percent annual chance (100-year) flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2 percent annual chance (500-year) flood is employed to indicate additional areas of flood risk in the community. For the stream studied in detail, the 100- and 500-year floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:24,000 with a contour interval of 10 feet (Reference 5).

For the streams studied by approximate methods, the 100-year flood boundaries were delineated using the Flood Hazard Boundary Map for the Township of Amity (Reference 6).

The 100- and 500-year floodplain boundaries are shown on the Flood Insurance Rate Map (Exhibit 1). On this map, the 100-year floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 500-year floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 100- and 500-year floodplain boundaries are close together, only the 100-year floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the streams studied by approximate methods, only the 100-year floodplain boundary is shown on the Flood Insurance Rate Map (Exhibit 1).

4.2 Floodways

The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 100-year flood can be carried without substantial increases in flood heights.

The concept of a floodway is not applicable to lacustrine flooding; therefore, no floodways are shown in this study.

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base flood elevations or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 100-year floodplains that are determined in the Flood Insurance Study by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance rate zone that corresponds to the areas of 100-year shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the detailed hydraulic analyses are shown within this zone.

Zone A99

Zone A99 is the flood insurance rate zone that corresponds to areas of the 100-year floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or depths are shown within this zone.

Zone V

Zone V is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Because approximate hydraulic analyses are

performed for such areas, no base flood elevations are shown within this zone.

Zone VE

Zone VE is the flood insurance rate zone that corresponds to the 100-year coastal floodplains that have additional hazards associated with storm waves. Whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 500-year floodplain, areas within the 500-year floodplain, and to areas of 100-year flooding where average depths are less than 1 foot, areas of 100-year flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 100-year flood by levees. No base flood elevations or depths are shown within this zone.

Zone D

Zone D is the flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

6.0 FLOOD INSURANCE RATE MAP

The Flood Insurance Rate Map is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 100-year floodplains that were studied by detailed methods, shows selected whole-foot base flood elevations or average depths. Insurance agents use the zones and base flood elevations in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 100- and 500-year floodplains. Floodways and the locations of selected cross sections used in the hydraulic analyses and floodway computations are shown where applicable.

7.0 OTHER STUDIES

Flood Insurance Studies for the Townships of Venango and Wayne, and the Boroughs of Wattsburg and Waterford have been published (References 7, 8, 9, and 10). The results of this study are in agreement with the results of those studies.

Due to its more detailed nature, this study supersedes the Flood Hazard Boundary Map for the Township of Amity (Reference 6).

8.0 LOCATION OF DATA

Information concerning the pertinent data used in preparation of this study can be obtained by contacting FEMA, the Natural and Technological Hazards Division, Liberty Square Building (Second Floor), 105 South Seventh Street, Philadelphia, Pennsylvania 19106.

9.0 BIBLIOGRAPHY AND REFERENCES

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4. U. S. Army Corps of Engineers, Pittsburgh District, Union City Reservoir - French Creek Basin, Reservoir Storage Frequency Curve, February 1971, (Unpublished).

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7. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Township of Venango, Erie County, Pennsylvania, Washington, D. C., September 30, 1981.

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